Resource Scarcity and Environmental Adaptation in Poorer Societies

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7. November 2014

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Abstract

Resource scarcity and environmental degradation due to population growth could be one of the reasons why poor societies, especially those that are dependent on resources, are failing to achieve high rates of growth and sustained economic growth[1]. This debate has long been running, extending back to Thomas Robert Malthus gloomy prediction that, "more people would doom us to a gigantic inevitable famine," however, there are conflicting views and examples of how human capacities have adapted to resource scarcity, sustaining their livelihoods, as well as reducing institutionalised poverty through innovation, technology and social organisation, hence the relationship between resource scarcity and environmental degradation especially in poorer societies.

Key words: Resource Scarcity, Environmental Degradation, Economic Growth

Introduction

While it is important to understand resource scarcity in the context of developing countries, as an absolute shortage of natural resources which can occur as a result of; increasing consumption of resources where demand exceeds available supply, or when there is uneven distribution of resources or access to resources (Homer-Dixon 1995), it is significant to reflect on the indirect effects of resource scarcity such as international conflict s over shared water resources, oceanic fisheries or other scarce resources which may occur as humans compete for these resources (Lester R. Brown, Gary Gardner, Brian Halwel, 1998, p.69).

Equally, that environmental adaptation includes measures such as technological innovations, changes in land use practices and economic diversification that reduce the impacts that local people have on their land and other natural resources (Batterbury, Simon; Forsyth, Tom. 1999). However, for successful environmental adaptation to occur, the market optimism assertions about adaptation that leans on just making markets and technologies work ought to endeavor understanding the political economy and diverse experiences of resources. In this view, the resources have to be useful for the local people, thus allowing productive agriculture and ecosystem services for the local people.

As questioned by anti-Malthusians, on whether right and inclusive institutions can avoid all environmental problems, depends entirely on the context of a particular environment. To mean,

[1] S.C.Lonergan, 345, Environmental Change, Adaptation and Security

that it might be able to work in a given environment as opposed to another. Additionally, it depends on whether the adaptive benefits are shared evenly amongst the individuals living in a poor society. Only wealthy families tend to adapt and in most cases women land ownership and property rights is limited (Rocheleau 1995).

Literature Review

Neo-Malthusians argument that finite natural resources compels limit on the growth of human population and consumption, when the limits exceeded, poverty, environmental degradation and social breakdown occurs, undeniably contrasts with non-Malthusians view, which asserts that there are few absolute limits to human population. Whilst it is worth acknowledging the significance of these two controversial arguments, it cannot be ignored that there is indeed a correlation between resource scarcity and environmental adaptation. Conversely, for adaptation to successfully transpire, individuals in poor societies must be entangled in transformational processes that take account of inclusive social and economic institutions as well as government bodies that allow for bottom up approaches. Nevertheless, this depends on access to markets and incentives to promote conservation, resource substitution, and development of new resources as well as technological innovations (Homer-Dixon 1995).

Examples

An example of the relationship between resource scarcity and environmental adaptation can be seen from the experience of Machakos County in Kenya, a hilly drought-prone farming region, overpopulated in relation to its carrying capacity, vividly displaying every phase of land misuse (Tiffen and Mortimore, 1994). Due to the high probability of droughts, the Akamba of Machakos resorted to planting drought resistant maize seedlings, locally known as Katumani Composite B (KCB) maize. Besides that, they identified and incorporated 35 fields and horticultural crops, 5 tillage technologies and 6 methods of soil fertility management which included use of green manure cover crops. As a result the county's dependency on imported food declined (Tiffen et al., 1994, p. 40-41). The Akamba conserved the environment, reduced birth rates, stepped up their use of animal fertilizers known as boma manure, sold food to burgeoning markets in nearby Nairobi, intensified livestock feeding systems and irrigation as well as faster tillage of their land using ox ploughs. Indeed, these were all pivotal in the transformation, and escape from the expected Malthusian collapse.

The role of proper functioning institutions as earlier mentioned, in the relationship between resource scarcity and environmental degradation appears as a key determinant to the success experienced in Machakos, because it allowed for access to financial capital. From the Swedish International Development Agency (SIDA)[2], the Machakos Integrated Development Project, the Catholic Diocese as well as the Kenyan government. These were not only required for terracing

[2] http://www.sida.se/english/

and ploughs but also for the hired labour. The social and institutional factors that facilitated the transformation included the formation of "Mwethya" groups after the abolition of compulsory work by the British farmers. These groups were used as the community rotational labour and financial contributions to terracing. They in turn boasted women's leadership and participation in the community (Tiffen and Mortimore (1994).

The Machakos experience undoubtedly challenges the pessimists' perspectives and demonstrates the relationship between resource scarcity and environmental degradation. Contrary to earlier expectations in 1930s, of a Malthusian collapse, the Akamba of Machakos put land degradation into reverse because more people provided labour and the necessity for transition to intensification and better land stewardship. Growing population encouraged innovation, information sharing and political involvement. Seconding the argument that, "resources are not, they become" (Zimmerman 1951:15). It is thus trivial, not to see a rapidly growing population as a problem for the environment as well as food production. Instead, to look at it as an opportunity for farming productivity to be triggered through agricultural innovations induced by population growth.

In the same way, the Wola people of Papua New Guinea also provide us with yet another example to explain the correlation between resource scarcity and environmental adaptation. Living in highland areas that are vulnerable to declining soil fertility and accelerating erosion, they learned to maintain soil fertility by constructing mounds of soil using rotting vegetation known as emhul as compost. Here, we can see how sustainable livelihood approaches have been employed through agricultural intensification by the technique of planting a variety of crops (sweet potato, taro, wild spinach, and sugar cane) during the first few years of cultivation and just sweet potato thereafter. The soil mounds provide a rich supply of carbon and nitrogen for the mixed crops, while sweet potato can thrive with far fewer nutrients (Batterbury, Simon, Forsyth, Tom, 1999).

Equally noteworthy are the Mien (Yao) people living in the highlands of northern Thailand, who offer a similar example of environmental adaptation and resource scarcity. As migrants from China, they practices shifting cultivation and repeatedly exhausted the soil, forcing them to relocate their villages after every 10 to 20 years. Since moving to Thailand, however, they remained settled for more than 50 years-more than enough time for their soil to lose its fertility. They avoided this threat by concentrating cultivation on the flatter slopes rather than the steeper ones where erosion is more likely to occur. Clearly, Mien farmers perceived the potential threat of erosion and adapted their farming practices to overcome it (Batterbury, Simon, Forsyth, Tom, 1999).

Other examples of the affiliation between resource scarcity and environmental adaptation include the farmers of Sahel area in West Africa, the Mossi of Burkina Faso as well as the Kano region of northern Nigeria, both faced with shortages of rainfall, droughts, increasing population and political uncertainty, nonetheless, they managed to experience successful adaptation by adopting

practices such as creating compost pits to enhance soil fertility and building diguettes (semi permeable lines of stone placed at right angles to the slope) to prevent erosion (Batterbury, Simon, Forsyth, Tom, 1999). These environmental adaptations at the local level have reduced the potential impact of drought or political economic uncertainties by diversifying the sources of income, promoting land conservation, and ensuring a more secure food supply. By and large, they demonstrate an intrinsic relationship between resource scarcity and how an environment can be able to adapt successfully.

Conclusion

In conclusion, the correlation between resource scarcity and environmental adaptation, admittedly, seems to have many examples with successes and failures as well. It is critical to to examine institutional factors that allow successful adaptation to take place and the narrative of collapse that might prevent and environment from adapting. Equally significant to know is how scarcity can be governed locally and by vulnerable people as well as the understanding of what resources are important to local people.

Despite resource scarcity in poorer societies, it is not ideal for so many people to always assume that there will be a crisis. As echoed by Sheikh Yamani, Saudi's oil minister in the 1970s, "the stone age did not come to an end because of a shortage of stone." It is better to focus on ways to avoid the crisis and help people rather restricting their actions.[3] The debate should not be whether Robert Malthus is right or wrong, but how we can avoid collapse through aid, famine relief and technology transfer. The most sustainable solution for environmental adaptation and management may be to consider adaptive capabilities as integral features of local livelihood systems and to support them where possible while continuing to tackle the more deep-seated causes of resource scarcity.

[3] DFID (2002) 'Myths of Poverty and Environment

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